

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

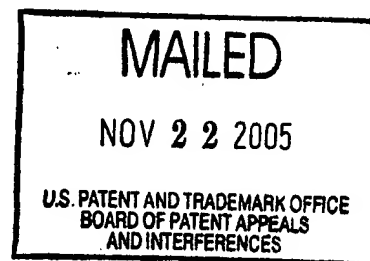
## UNITED STATES PATENT AND TRADEMARK OFFICE

### BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

*Ex parte* JON TSCHUDI

Appeal No. 2005-2665  
Application No. 09/424,210

HEARD: Nov. 16, 2005



Before KRASS, DIXON, and BARRY, *Administrative Patent Judges*.  
BARRY, *Administrative Patent Judge*.

A patent examiner rejected claims 15-28. The appellant appeals therefrom under 35 U.S.C. § 134(a). We reverse.

#### I. BACKGROUND

The invention at issue on appeal measures structures in a fingerprint. According to the appellant, increased needs for security and increased availability of pattern recognition algorithms have brought fingerprint identification to the fore. (Spec. at 1.) Systems employing two-dimensional ("2-D") sensor arrays with dimensions comparable to the size of a fingerprint have been on the market. (*Id.* at 1-2.) Because the systems

require a large number of sensors, opines the appellant, "[t]hese are expensive and difficult to produce." (*Id.* at 2.)

Because the appellant's invention employs fewer sensors compared to the known solutions, he asserts, "it is inexpensive and relatively simple to make." (*Id.*) A fingerprint to be measured is moved past an "essentially one-dimensional array" of sensors. (*Id.* at 3.) A further understanding of the invention can be achieved by reading the following claims.

15. A method for sensing a fingerprint comprising:

generating a plurality of images of different portions of a fingerprint surface by measuring structural features of the fingerprint surface at given intervals of time with an essentially one-dimensional sensor array as the fingerprint surface is moved relative to the sensor array in a direction that is generally perpendicular to the sensor array;

determining which of the plurality of images overlap or partially overlap others of the plurality of images;

disregarding those images which overlap or partially overlap one or more other images; and

constructing a two-dimensional image of the fingerprint surface from only non-overlapping images obtained from said generating step.

18. A method of sensing a fingerprint comprising:

applying a varying voltage to a finger positioned over an electrode;  
and

measuring the capacitance or impedance between the electrode and a capacitive sensor array through a fingerprint surface positioned over both the electrode and the capacitive sensor array, wherein the capacitive sensor array is separately disposed from the electrode and the capacitive sensor array is adapted to detect variations in capacitance or impedance across the array caused by structural features of a portion of the fingerprint surface positioned over the array.

Claims 15-17 and 20-28 stand rejected under 35 U.S.C. § 112, ¶ 1, as lacking a written description. Claims 15 and 16 stand rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,289,114 ("Mainguet"); claims 18 and 19 stand rejected under § 102(e) as anticipated by U.S. Patent No. 5,828,773 ("Setlak").

## II. OPINION

Our opinion addresses the rejections in the following order:

- written description rejection of claims 15-17 and 20-28
- anticipation rejection of claims 15 and 16
- anticipation rejection of claims 18 and 19.

A. WRITTEN DESCRIPTION REJECTION OF CLAIMS 15-17 AND 20-28

Rather than reiterate the positions of the examiner or the appellant *in toto*, we focus on the points of contention therebetween, which follow:

- disregarding overlapping images and constructing a 2-D image from only non-overlapping images
- using an ascertained speed to determine overlapping images or relative positioning of images.

*1. Disregarding overlapping images and  
constructing a 2-D image from only non-overlapping images*

The examiner asserts, "In the situation where *all* of the images are overlapping or partially overlapping, *all* of the images will have been disregarded . . . and therefore, the final 2-D image is unable to be constructed." (Supp. Examiner's Answer<sup>1</sup> at 11.) The appellant makes the following argument.

Except for the first image, each image will overlap the image that precedes it, and, except for the last image, each image will be overlapped by the image that follows it. It is only the following image which overlaps a preceding image, not vice versa. By constructing the two-dimensional image with, for example, every other or every third image (depending on the size of image, speed of finger movement, and frequency of sampling),

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<sup>1</sup>Because the original Examiner's Answer was defective, (Paper No. 23), we refer to the "Supplemental Examiner's Answer" in lieu thereof. The latter would have been better entitled "Substitute Examiner's Answer."

the constructed two-dimensional image is formed with adjacent images having no portions overlapping.

(Reply Br. at 2.)

In addressing the point of contention, the Board conducts a two-step analysis. First, we construe the claim at issue to determine its scope. Second, we determine whether the construed claim had adequate support.

a. Claim Construction

"Analysis begins with a key legal question — what is the invention claimed?" *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1567, 1 USPQ2d 1593, 1597 (Fed. Cir. 1987). Here, claims 15 and 24 recite in pertinent part the following limitations: "disregarding those images which overlap or partially overlap one or more other images; and constructing a two-dimensional image of the fingerprint surface from only non-overlapping images obtained from said generating step." Claim 25 recites similar limitations. Accordingly, claims 15, 24, and 25 require disregarding overlapping images and constructing a 2-D image from only non-overlapping images.

b. Support Determination

"Although [the appellant] does not have to describe exactly the subject matter claimed, . . . the description must clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563, 19 USPQ2d 1111, 1116 (Fed. Cir. 1991) (quoting *In re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989)). "[T]he test for sufficiency of support . . . is whether the disclosure of the application relied upon 'reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter.'" *Ralston Purina Co. v. Far-Mar-Co., Inc.*, 772 F.2d 1570, 1575, 227 USPQ 177, 179 (Fed. Cir. 1985) (quoting *In re Kaslow*, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983)). "Application sufficiency under §112, first paragraph, must be judged as of the filing date [of the application]." *Vas-Cath*, 935 F.2d at 1566, 19 USPQ2d at 1119 (citing *United States Steel Corp. v. Phillips Petroleum Co.*, 865 F.2d 1247, 1251, 9 USPQ2d 1461, 1464 (Fed. Cir. 1989)).

Here, the original specification discloses that "if the fingerprint is moved slowly over the sensor, while the sampling or measuring frequency is high, the redundant data may simply be **neglected** and the image of the finger print is comprised by each second or third set of data." (Spec. at 5 (emphasis added).) The examiner admits that

"the claimed step of 'determining which of the plurality of images overlap or partially overlap other of the plurality of images' is thought to be implicitly disclosed by the 'neglecting of redundant data.'" (Supp. Examiner's Answer at 10.) For our part, we are persuaded that the same disclosure reasonably conveys to the artisan that the appellant had possession of disregarding overlapping images and constructing a 2-D image from only non-overlapping images as of the filing date of the application.

*2. Using an ascertained speed to determine overlapping images  
or relative positioning of images*

The examiner asserts, "it is unclear whether determining which images overlap necessitates utilizing the speed of the finger, or that the process of determining which images overlap inherently involves utilizing the speed to make the determination."

(Supp. Examiner's Answer at 12.) He further asserts, "the Specification . . . does not disclose subsequently using the speed again . . . for combining the one-line images formed based on the speed in order to form the final 2-D image of the fingerprint." (Id. at 13.) The appellant makes the following argument.

One of ordinary skill in the art would readily recognize that the amount of image overlap is dependent on the width of the images, the speed of the finger, and the sampling rate. The width of the image is defined by the width of the sensor line and is fixed. Thus, for a given sampling rate (which would typically be fixed) the only variable which determines the amount of overlap is the speed of the finger. See Tschudi Declaration at

¶¶ 10-11. Thus, the specification does support the limitation of using the ascertained speed to determine which of the images overlap.

(Reply Br. at 4.)

a. Claim Construction

Claims 20 and 21 recite in pertinent part the following limitations: "using the ascertained speed to determine the required relative positioning of at least a portion of the plurality of images to form a two dimensional image of the fingerprint surface larger than any one of the plurality of images." Claim 24 recites in pertinent part the following limitations: "using the ascertained speed to determine which of the plurality of images overlap or partially overlap others of the plurality of images."

Claim 25 recites limitations similar to those of claim 24. Accordingly, claims 20, 21, 24, and 25 require using an ascertained speed to determine either the required relative positioning of images or which of the images overlap others.

b. Support Determination

The original specification discloses that **"if the fingerprint is moved slowly over the sensor,** while the sampling or measuring frequency is high, the redundant data may simply be neglected and the image of the finger print is comprised by each



second or third set of data." (Spec. at 5 (emphasis added).) The "[e]xaminer agrees that the term 'speed', as cited in the claims, essentially corresponds to the term 'movement' as cited in the Specification." (Supp. Examiner's Answer at 11-12.) For our part, we are persuaded that the disclosure reasonably conveys to the artisan that the appellant had possession of using an ascertained speed to determine either the required relative positioning of at least a portion of a plurality of images to form the 2-D image or which of the images overlap others as of the filing date of the application. Therefore, we reverse the written description rejection of claims 15-17 and 20-28.

#### B. ANTICIPATION REJECTION OF CLAIMS 15 AND 16

The examiner makes the following assertion.

Mainguet . . . constructs the final 2-D image of the fingerprint by correlating the overlapping images and "stitching" them together, resulting in a final image whereby the partially overlapping images have been disregarded. As can be seen in figure 12, the final image consists of only non-overlapping image features, and the overlap between successive images is essentially disregarded, or canceled out.

(Supp. Examiner's Answer at 5.) The appellant makes the following argument.

Mainguet specifically uses overlapping images to construct the two-dimensional image of the fingerprint surface. No images are disregarded. The fact that the overlapping portions of images are superimposed in constructing the two-dimensional image does not mean

that any of the superimposed overlapping portions are disregarded and does not mean that the image is constructed of only non-overlapping images.

(Reply Br. at 5.)

In addressing the point of contention, the Board conducts a two-step analysis. First, we construe the claim at issue to determine its scope. Second, we determine whether the construed claim is anticipated.

#### 1. CLAIM CONSTRUCTION

As explained regarding the written description rejection, claim 15 requires **disregarding** overlapping images and constructing a 2-D image from only **non-overlapping** images.

#### 2. ANTICIPATION DETERMINATION

"Having construed the claim limitations at issue, we now compare the claims to the prior art to determine if the prior art anticipates those claims." *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1349, 64 USPQ2d 1202, 1206 (Fed. Cir. 2002).

"[A]nticipation is a question of fact." *In re Hyatt*, 211 F.3d 1367, 1371, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000) (citing *Bischoff v. Wethered*, 76 U.S. (9 Wall.) 812, 814-15

(1869); *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997)). "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (citing *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 715, 223 USPQ 1264, 1270 (Fed. Cir. 1984); *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983); *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771, 218 USPQ 781, 789 (Fed. Cir. 1983)). "[A]bsence from the reference of any claimed element negates anticipation." *Kloster Speedsteel AB v. Crucible, Inc.*, 793 F.2d 1565, 1571, 230 USPQ 81, 84 (Fed. Cir. 1986).

Here, Mainguet discloses "a sensor belonging to [a] fingerprint-reading means wherein the surface area of the sensor is smaller than the surface area of the fingerprint and delivers only partial images of the complete fingerprint. The reconstruction of the complete image of the fingerprint is obtained by the superimposition of successive images given by the sensor during its relative shift with respect to the finger." Col. 3, ll. 27-34. In reconstructing the complete image of the fingerprint, however, we are unpersuaded that the reference disregards overlapping images or reconstructs the complete image from only non-overlapping images. To the

contrary, it emphasizes that "it is absolutely necessary to have sufficient overlapping between two successive images," col. 5, ll. 28-29; "in practice, overlapping by about five to six rows appears to be necessary in order to overcome certain defects of the sensor and make the system more tolerant to losses of image quality. . . ." *Id.* at ll. 34-37.

Mainguet's superimposition of successive images "consist[s] in successively trying out all the possible cases of overlapping between the images I0 and I1 and in assigning a correlation coefficient to each trial." Col. 8, ll. 15-17. "The best correlation coefficient will inform the system of the optimum position of overlapping of the two images I0 and I1, and the operation will be recommenced with the next image I2 given by the sensor 50 to the microprocessor 60 and so on and so forth until the fingerprint is completely reconstituted." *Id.* at ll. 17-23. Figure 12 of the reference shows that overlapping images are used, rather than discarded, in the reconstruction.

The absence of disregarding overlapping images and constructing a 2-D image from only non-overlapping images negates anticipation. Therefore, we reverse the anticipation rejection of claim 15 and of claim 16, which depends therefrom.

### C. ANTICIPATION DETERMINATION OF CLAIMS 18 AND 19

The examiner asserts, "Setlak discloses . . . applying a varying voltage (74) to a finger positioned over an electrode (ground electrode 54) (the voltage is applied via excitation electrode 71 and sensing electrode 78 - that is, the AC voltage is present at sensing electrodes 78 until the finger completes the circuit and closes the path for current to flow to ground 54). . . ." (Supp. Examiner's Answer at 15-16.) The appellant argues, "Setlak . . . does not apply a varying voltage to the finger. In Setlak, the excitation signal is constantly applied to the sensor. Tschudi Decl. ¶ 18." (Appeal Br. at 19.)

#### 1. CLAIM CONSTRUCTION

Claim 18 recites in pertinent part the following limitations: "applying a **varying** voltage to a finger positioned over an electrode." (Emphasis added.)

#### 2. ANTICIPATION DETERMINATION

Setlak discloses a "fingerprint sensor 30." Col. 5, l. 53. "The sensor 30 includes a substrate 65, and one or more active semiconductive layers 66 thereon. A ground plane electrode layer 68 is above the active layer 66 and separated therefrom by an insulating layer 67." Col. 6, ll. 34-37. "A drive electrode layer 71 is positioned over


another dielectric layer 70 and is connected to an excitation drive amplifier 74." *Id.* at 37-40. Although the excitation drive amplifier generates an excitation drive signal, the examiner has not shown that the signal is varying. To the contrary, the reference discloses that "[t]he excitation drive signal . . . is **coherently** delivered across all of the array." *Id.* at ll. 40-42.

The absence of applying a voltage that varies negates anticipation. Therefore, we reverse the anticipation rejection of claim 18 and of claim 19, which depends therefrom.

### III. CONCLUSION

In summary, the rejection of claims 15-17 and 20-28 under 35 U.S.C. § 112, ¶ 1, is reversed. The rejections of claims 15, 16, 18, and 19 under § 102(e) are also reversed.

  
ERROL A. KRASS )  
Administrative Patent Judge )

  
JOSEPH L. DIXON  
Administrative Patent Judge

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